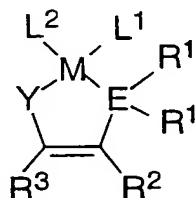
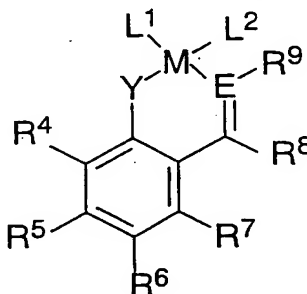


We claim:

1. A process for emulsion polymerizing one or more olefins by reacting the olefins with a complex compound of the formula Ia or Ib or with a mixture of the complex compounds Ia and Ib



Ia



Ib

where:

- M is a transition metal from groups 7 to 10 of the Periodic Table of the Elements;
- L¹ is phosphines (R¹⁶)_xPH_{3-x} or amines (R¹⁶)_xNH_{3-x} with identical or different radicals R¹⁶, ethers (R¹⁶)₂O, H₂O, alcohols (R¹⁶)OH, pyridine, pyridine derivatives of the formula C₅H_{5-x}(R¹⁶)_xN, CO, C₁-C₁₂ alkyl nitriles, C₆-C₁₄ aryl nitriles or ethylenically unsaturated double bond systems, x being an integer from 0 to 3,
- L² is halide ions, amide ions R_hNH_{2-h}, h being an integer from 0 to 2, and also C₁-C₆ alkyl anions, allyl anions, benzyl anions or aryl anions, it being possible for L¹ and L² to be linked to one another by one or more covalent bonds,
- E is nitrogen, phosphorus, arsenic or antimony,
- X is -SO₃⁻, -O-PO₃²⁻, NH(R¹⁵)₂⁺, N(R¹⁵)₃⁺ or -(OCH₂CH₂)_nOH,
- and
- n is an integer from 0 to 15,
- Y is oxygen, sulfur, N-R¹⁰ or P-R¹⁰,
- R¹ is hydrogen, C₁-C₁₂ alkyl groups, C₇-C₁₃ aralkyl radicals and C₆-C₁₄ aryl groups, unsubstituted or substituted by a hydrophilic group X,
- R² and R³ are hydrogen, hydrophilic groups X, C₁-C₁₂ alkyl, it being possible for the alkyl groups to be branched or unbranched, C₁-C₁₂ alkyl substituted one or more times by identical or different substituents comprising C₁-C₁₂ alkyl groups, halogens, hydrophilic groups X, C₁-C₁₂ alkoxy

groups or C₁-C₁₂ thioether groups,
 C₇-C₁₃ aralkyl,
 C₃-C₁₂ cycloalkyl,
 C₃-C₁₂ cycloalkyl substituted one or more times by
 5 identical or different substituents comprising C₁-C₁₂
 alkyl groups, halogens, hydrophilic groups X, C₁-C₁₂
 alkoxy groups or C₁-C₁₂ thioether groups,
 C₆-C₁₄ aryl,
 C₆-C₁₄ aryl substituted one or more times by identical
 10 or different substituents comprising C₁-C₁₂ alkyl
 groups, halogens, hydrophilic groups X, monohalogenated
 or polyhalogenated C₁-C₁₂ alkyl groups, C₁-C₁₂ alkoxy
 groups, silyloxy groups OSiR¹⁰R¹¹R¹², amino groups NR¹³R¹⁴
 or C₁-C₁₂ thioether groups,
 15 C₁-C₁₂ alkoxy groups,
 silyloxy groups OSiR¹⁰R¹¹R¹²,
 halogens
 or amino groups NR¹³R¹⁴,
 it being possible for the radicals R² and R³ together to
 20 form a saturated or unsaturated 5- to 8-membered ring,
 and
 at least one radical R¹, R² or R³ carrying a hydrophilic
 group X;
 R⁴ to R⁷ are hydrogen,
 25 hydrophilic groups X,
 C₁-C₁₂ alkyl, it being possible for the alkyl groups to
 be branched or unbranched,
 C₁-C₁₂ alkyl, substituted one or more times by identical
 or different substituents comprising C₁-C₁₂ alkyl
 30 groups, halogens, hydrophilic groups X, C₁-C₁₂ alkoxy
 groups or C₁-C₁₂ thioether groups,
 C₇-C₁₃ aralkyl,
 C₃-C₁₂ cycloalkyl,
 C₃-C₁₂ cycloalkyl substituted one or more times by
 35 identical or different substituents comprising C₁-C₁₂
 alkyl groups, halogens, hydrophilic groups X, C₁-C₁₂
 alkoxy groups or C₁-C₁₂ thioether groups,
 C₆-C₁₄ aryl,
 C₆-C₁₄ aryl substituted one or more times by identical
 40 or different substituents comprising C₁-C₁₂ alkyl
 groups, halogens, hydrophilic groups X, monohalogenated
 or polyhalogenated C₁-C₁₂ alkyl groups, C₁-C₁₂ alkoxy
 groups, silyloxy groups OSiR¹⁰R¹¹R¹², amino groups NR¹³R¹⁴
 or C₁-C₁₂ thioether groups,
 45 C₁-C₁₂ alkoxy groups,
 silyloxy groups OSiR¹⁰R¹¹R¹²,

halogens,
NO₂ groups
or amino groups NR¹³R¹⁴,
it being possible for pairs of adjacent radicals R⁴ to R⁷
5 together to form a saturated or unsaturated 5-8-membered
ring,

R⁸ and R⁹ are hydrogen, C₁-C₆ alkyl groups, C₇-C₁₃
aralkyl radicals and C₆-C₁₄ aryl groups, unsubstituted
10 or substituted by a hydrophilic group X,
R¹⁰ to R¹⁵ are selected independently of one another from
hydrogen, C₁-C₂₀ alkyl groups, which may be substituted
in turn by O(C₁-C₆ alkyl) or N(C₁-C₆ alkyl)₂ groups, or
are C₃-C₁₂ cycloalkyl groups, C₇-C₁₃ aralkyl radicals and
15 C₆-C₁₄ aryl groups;
R¹⁶ is hydrogen, C₁-C₂₀ alkyl groups, which may in turn be
substituted by O(C₁-C₆ alkyl) or N(C₁-C₆ alkyl)₂ groups,
or is C₃-C₁₂ cycloalkyl groups, C₇-C₁₃ aralkyl radicals
and C₆-C₁₄ aryl groups unsubstituted or substituted by a
20 hydrophilic group X,

in water or in a solvent mixture containing at least 50% by
volume of water, optionally in the presence of an activator
and an emulsifier.

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2. A process as claimed in claim 1 with complex compounds of the
formula Ib in which at least one radical R⁴ to R⁹ carries a
hydrophilic group X.
- 30 3. A process as claimed in claim 1 or 2 by reacting the olefin
with at least one electrically neutral nickel complex
compound of the formula Ia or Ib.
4. A process as claimed in any of claims 1 to 3, wherein the
35 activator comprises olefin complexes of rhodium or of nickel.
5. A process as claimed in any of claims 1 to 4 in the presence
of an emulsifier.
- 40 6. A process as claimed in any of claims 1 to 5 wherein one of
the olefins is ethylene.
7. A process as claimed in any of claims 1 to 5, wherein one
olefin is ethylene and the comonomer is selected from
45 propylene, 1-butene, 1-hexene and styrene.

8. A process as claimed in any of claims 1 to 5, wherein one olefin is ethylene and the comonomer is selected from norbornene, norbornadiene and cis- and trans-2-butene.
- 5 9. A dispersion of polyethylene or ethylene copolymers in water obtainable as claimed in any of claims 1 to 8.
10. The use of an aqueous polyethylene dispersion as claimed in claim 9 for paper applications such as paper coating or
10 surface sizing, paints, adhesive base materials, molded foams such as mattresses, textile and leather applications, carpet back coatings or pharmaceutical applications.
11. A paper size or colored paper coating slip comprising a
15 dispersion as claimed in claim 9.
12. A paint comprising a dispersion as claimed in claim 9.
13. An adhesive base material comprising a dispersion as claimed
20 in claim 9.
14. A molded foam or mattress produced from a dispersion as claimed in claim 9.
- 25 15. A textile or leather application comprising a dispersion as claimed in claim 9.
16. A carpet back coating comprising a dispersion as claimed in claim 9.
- 30 17. A pharmaceutical preparation comprising a dispersion as claimed in claim 9.

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